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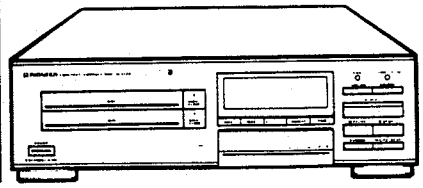
Service Manual



SERVICE GUIDE

ORDER NO.
ARP2144

TWIN-TRAY COMPACT DISC PLAYER

PD-Z74T

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DISASSEMBLY AND REASSEMBLY PROCEDURE OF TWIN MECHANISM

1. DISASSEMBLY

1.1 REMOVAL OF TRAY I

(1) Set the tray I to the OPEN position by pressing the OPEN/CLOSE button.

Note: When openning the tray I manually, insert a finger from the groove and rotate the idler gear in clockwise direction, shown in Fig. 1–1.

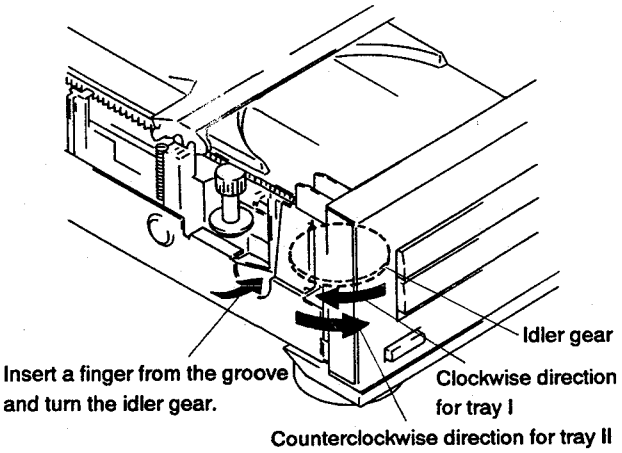
Idler gear
Insert a finger from the groove and turn the idler gear.
Clockwise direction for tray I
Counterclockwise direction for tray II

Fig. 1–1

(2) As shown in Fig. 1–2, insert a screw driver to the left slit of the tray I and pull out the tray in the direction of the arrow B, while the screw driver keeping to press in the direction of the arrow A.

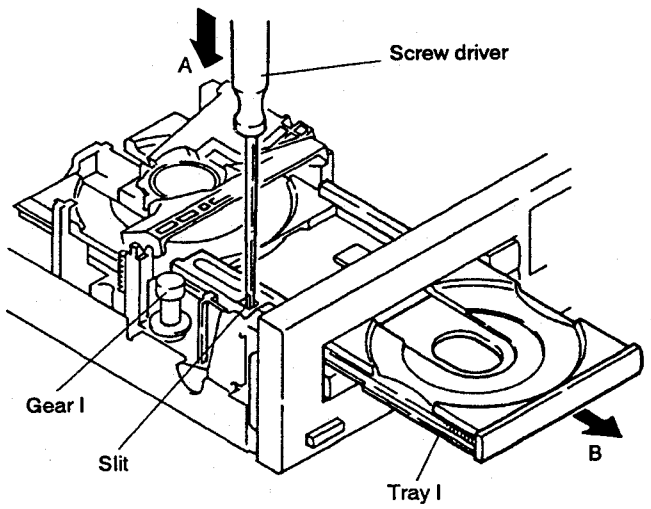

Fig. 1–2

1.2 REMOVAL OF TRAY II

(1) Set the tray II to the OPEN position by pressing the OPEN/CLOSE button.

Note: When openning the tray II manually, rotate the idler gear in the counterclockwise direction, shown in Fig. 1–1.

(2) As shown in Fig. 1–3, insert a screw driver to the right slit of the tray II and pull out the tray in the direction of the arrow B, while the screw driver keeping to press in the direction of the arrow A.

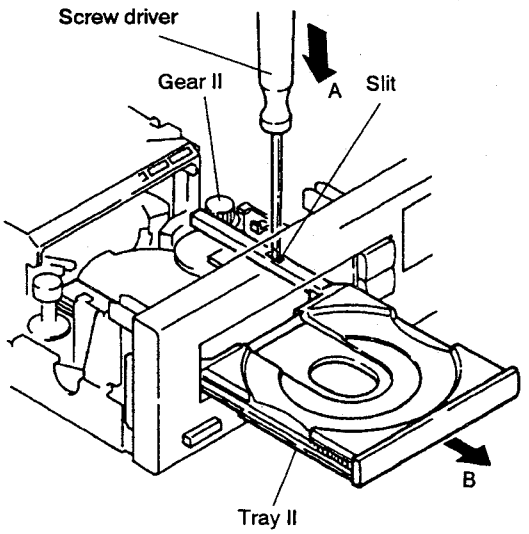

Fig. 1–3

1.3 REMOVAL OF CLAMPER ARM U AND B

(1) As shown in Fig. 1–4, rotate the idler gear so that the clamper assembly not to be clamped on the disc table. Next, take out the clamp sprig and the screw Ⓐ, and remove the clamper arm U and B.

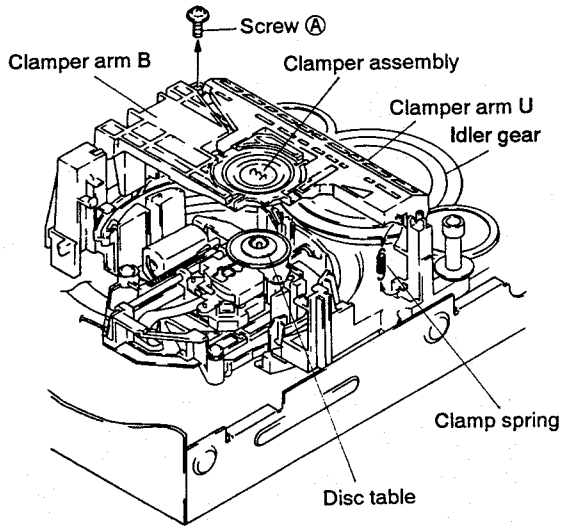

Fig. 1–4

1.4 REMOVAL OF SERVO MECHANISM ASSEMBLY

(1) Remove the tray I. (Refer to 1.1, REMOVAL OF TRAY I)
(2) Remove the tray II. (Refer to 1.2, REMOVAL OF TRAY II)
(3) Remove the clamper arm U and B. (Refer to 1.3, REMOVAL OF CLAMPER ARM U AND B)
(4) Remove four screws holding the servo mechanism assembly.

Note: As shown in Fig. 1–5, lead wires from the servo mechanism assembly are fixed by two hooks and a binder on the back of the twin tray mechanism section.

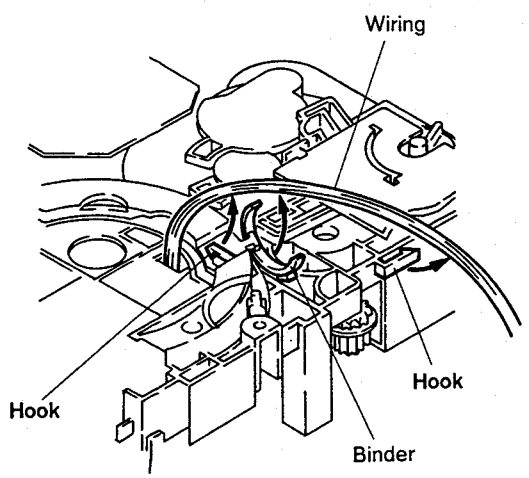

Fig. 1–5

1.5 REMOVAL OF LOADING BELT AND LOADING MOTOR

(1) Remove the tray I. (Refer to 1.1, REMOVAL OF TRAY I)
(2) Set the tray II to the OPEN position. (Refer to 1.2, REMOVAL OF TRAY II (1))
(3) Remove the belt and two screws Ⓑ, shown in Fig. 1–6.

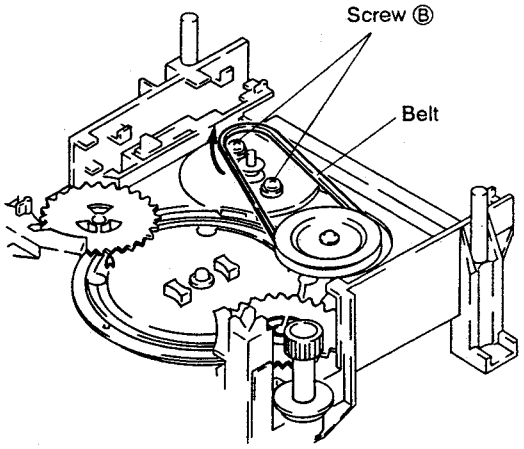

Fig. 1–6

(4) Set the tray II to the Close position.
(5) Remove screws holding the twin tray mechanism, and take out the twin tray mechanism from the body.
(6) Turn over the twin tray mechanism to set the position as shown in Fig. 1–7.
(7) Remove a screw Ⓒ holding the mechanism PCB assembly.
(8) Hold the A section of the mechanism PCB assembly and lift it up to the direction of the arrow, and remove the loading motor accompanied with the mechanism PCB assembly.

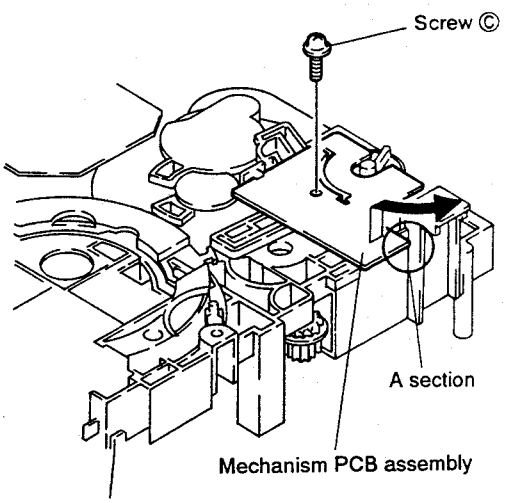

Fig. 1–7

2. REASSEMBLY

2.1 ASSEMBLY OF CLAMPER CAM AND FLOATING BASE

(1) As shown in Fig. 2–1, adjust the notches (3 points) in the clamper cam to the claws (3 points) of the loading base, and set the clamper cam to the position as the arrow shows.

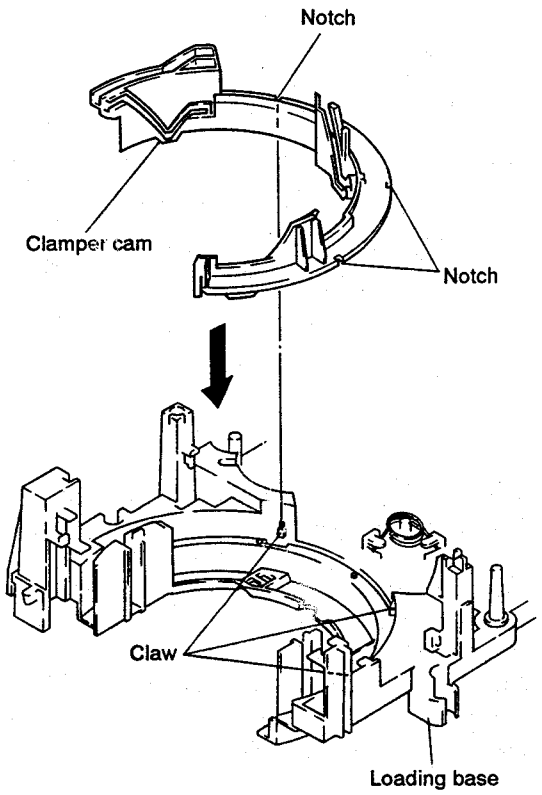

Fig. 2–1

(2) After adjusting the notches in the clamper cam to the claws (3 points) showing in Fig. 2–1, place the protrusions of the floating base on the grooves (2 points) of loading base as the arrow shows in Fig. 2–2.

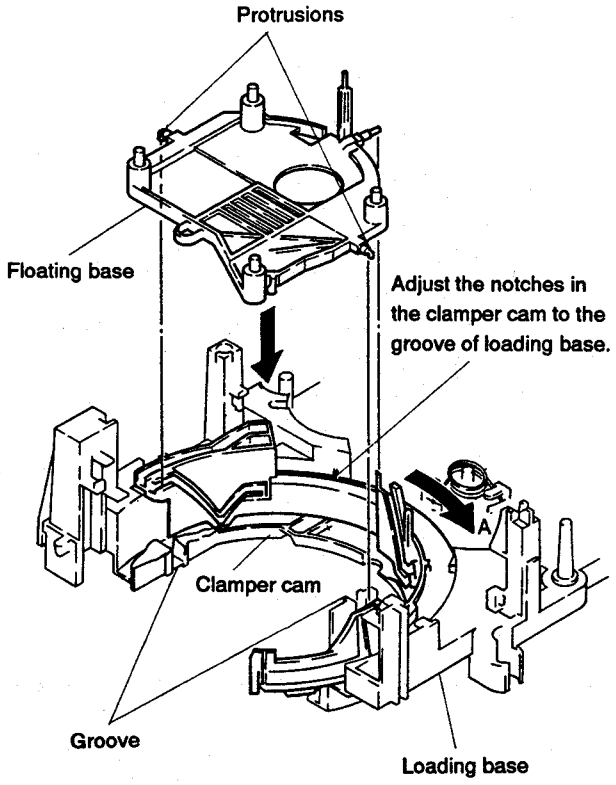

Fig. 2–2

(3) Rotate the clamper cam in the direction of the arrow A, and stop the rotation when the floating base reaches to the lowest position.

Note: Keep the floating base to the lowest position till the assembling of the main cam, follow gear, gear I, gear II, clamper arm U and B is completed.

2.2 ASSEMBLY OF MAIN CAM, FOLLOW GEAR, GEAR I, GEAR II AND GEAR PULLEY

(1) As shown in Fig. 2–3, attach the main cam, trying to adjust the main cam hole A to the clamper cam protrusion. Next, hold it with screw Ⓓ.

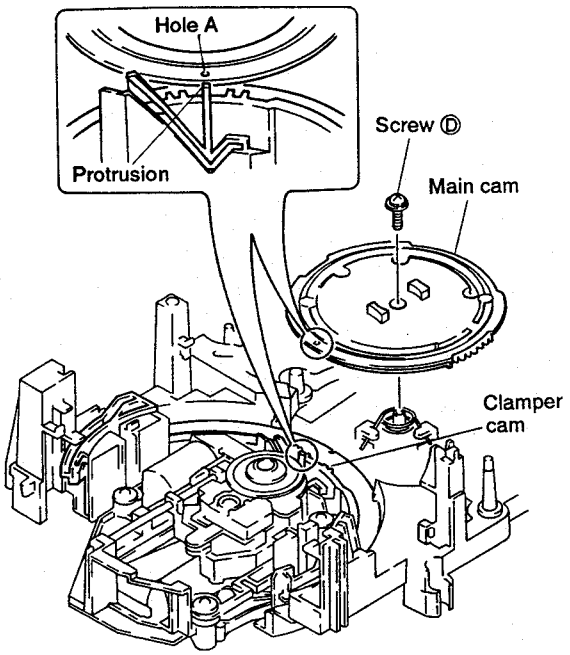

Fig. 2–3

(2) As shown in Fig. 2–4, after adjusting ♡ marks (2 points) on the main cam to the same marks on the two follow gears, insert them into the section A and B respectively.

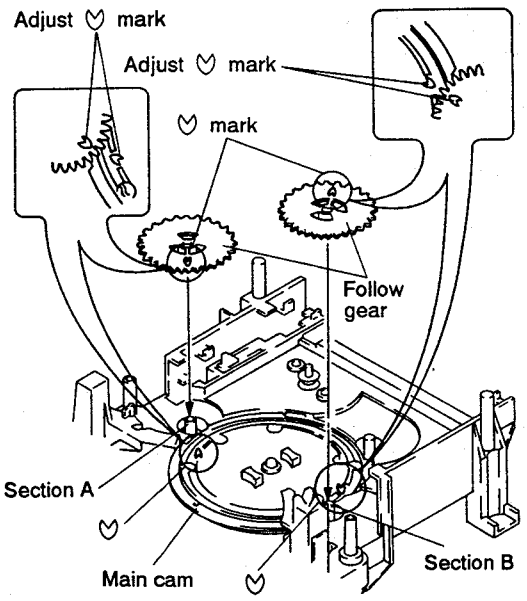

Fig. 2–4

(3) As shown in Fig. 2–5, adjust ⌂ mark on the gear I and the gear II to the hole ⌂ on follow gears, insert to positions shown in Fig., and hold them with two screws Ⓔ respectively.

(4) Insert the gear pulley to the position shown in Fig., and hold with the screw Ⓕ.

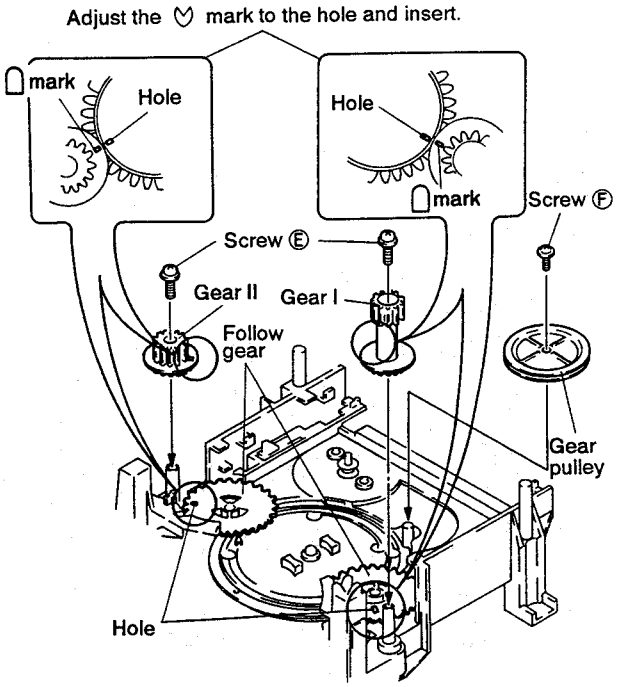

Fig. 2–5–1

(5) Finally, each gear position should be as follows.

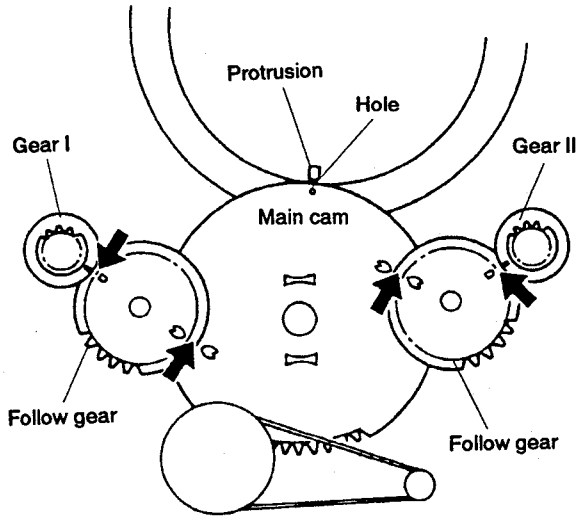

Fig. 2–5–2

2.3 ASSEMBLY OF CLAMPER ARM B, CLAMPER ARM U AND CLAMPER ASSEMBLY

(1) As shown in Fig. 2–6, insert the protrusion A of the clamper arm B into the groove of the loading base, and insert the protrusion C into the groove on the loading base, while the protrusion B being inserted into the groove on the clamper cam.

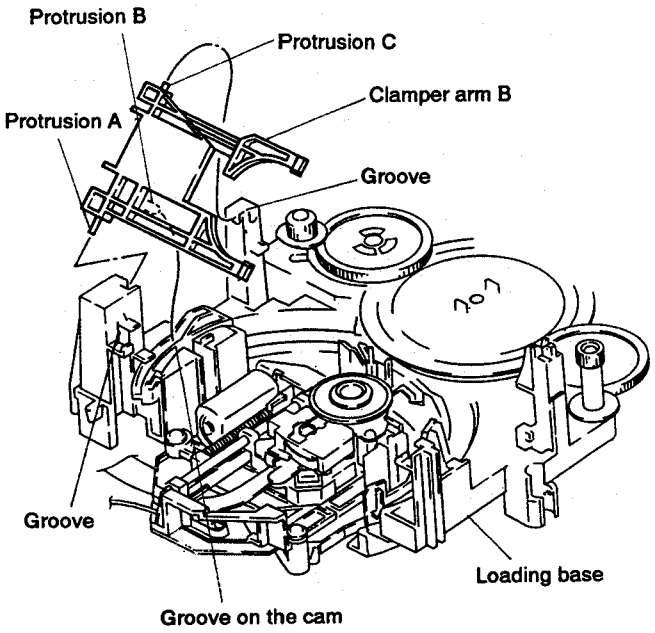

Fig. 2–6

(2) As shown in Fig. 2–7, attach the clamper assembly to the clamper arm B so that the protrusion D of the clamper assembly may turn to the position as Fig. shows.

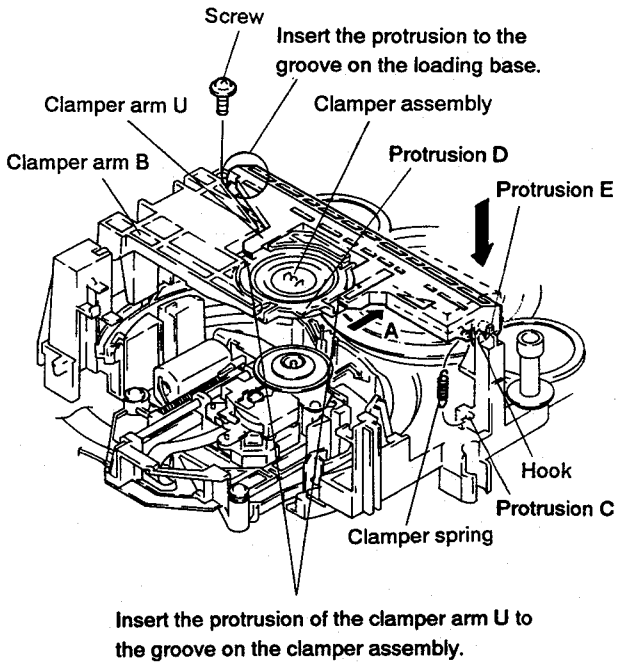

Fig. 2–7

(3) As shown in Fig. 2–7, insert the protrusion of the clamper arm U to the groove on the clamper assembly, and slide in the direction of the arrow A. Next, insert the protrusion of the clamper arm U to the groove on the loading base, while the protrusion E being pushed into the hook of the loading base.

2.4 ASSEMBLY OF LOADING MOTOR

(1) Press down the motor pulley toward the upper surface of the loading motor, keeping the space of 3 mm between the motor pulley and the upper surface of the loading motor.

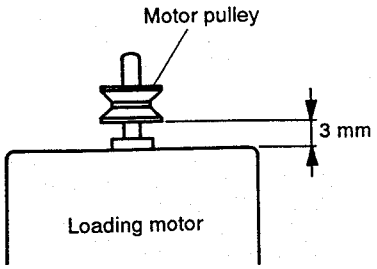

Fig. 2–8

(2) Solder the terminals of the loading motor to the mechanism PCB assembly. Since the loading motor has polarity, the positional relation between the label of the motor and the mechanism PCB assembly is shown in Fig. 2–9.

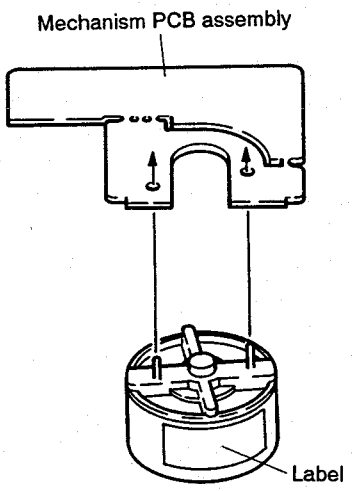

Fig. 2–9

(3) As shown in Fig. 2–10, after turning over the loading base, insert section A into the section B as the arrow shows, and fix with the screw Ⓒ.

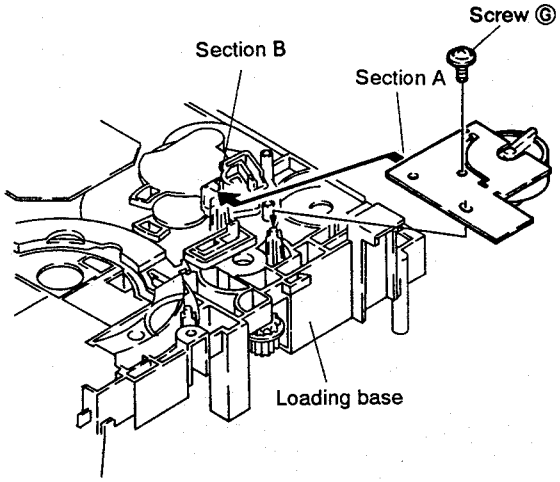

Fig. 2–10

(4) Turn over the loading base once again, and tighten the loading motor with two screws Ⓑ and set the belt as shown in Fig. 2–11.

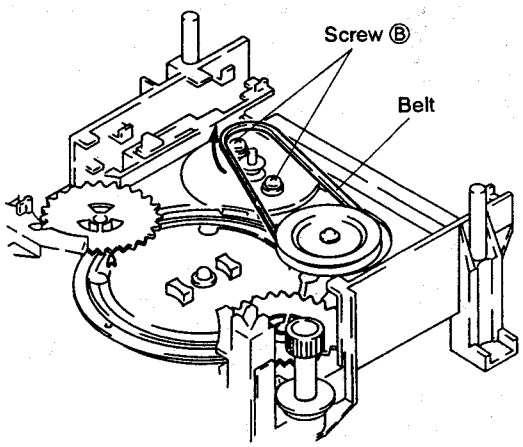

Fig. 2–11

2.5 ASSEMBLY TRAY I AND TRAY II

(1) As shown in Fig. 2–12, attach the lock lever and the lever spring to the sub tray (the two same forms), which must be placed to the left hand of the sub tray, if the sub tray is attached with the tray I, and which must be placed to the right hand of it, if it is attached with the tray II, looking from the front of the sub tray.

Note: Two lock levers are the same forms.

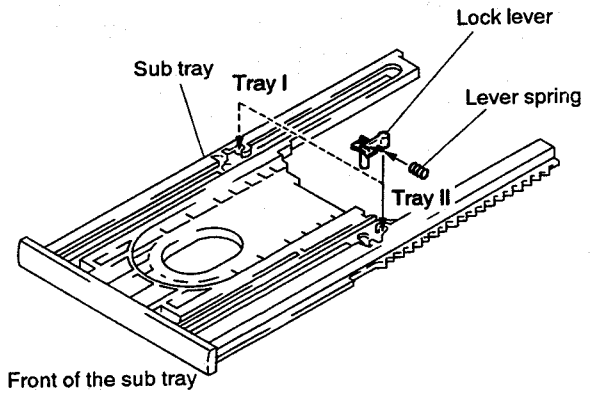

Fig. 2–12

(2) As shown in Fig. 2–13, attach the tray I or II to the sub tray by the hook applied to the section A. At that time note that the tray I has the gear on the left hand, and the tray II has the gear on the right hand. When attaching respectively, make sure the position where the lock lever attached.

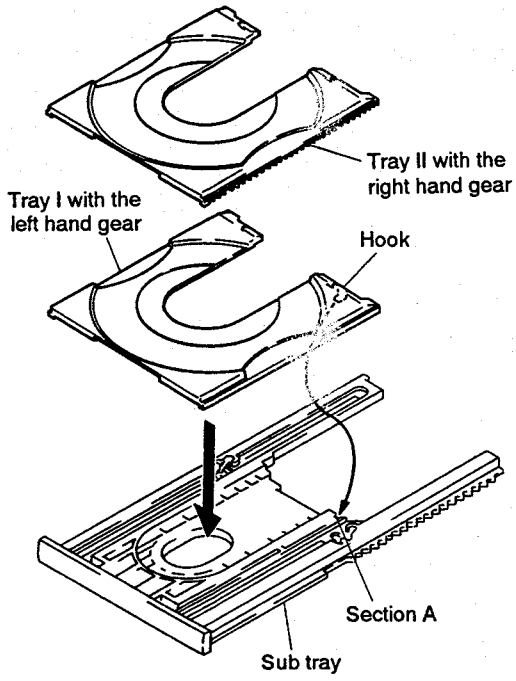

Fig. 2–13

(3) As shown in Fig. 2–14, turn over the tray, and put three screws Ⓗ on it.

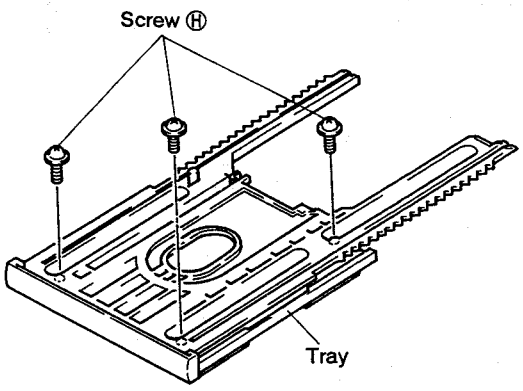

Fig. 2–14

2.6 ATTACHMENT OF TRAY II

(1) Press the OPEN/CLOSE button to make the tray I is in clamp condition, and the tray II is in open condition.

Note 1: When opening the tray II manually, insert a finger into the groove shown in Fig. 2–15, and fully rotate the idler gear counterclockwise. (As for the idler gear, refer to Fig. 1–1)

Note 2: Tray I should be attached after tray II's attachment has been completed.

(2) As shown in Fig. 2–15, adjust the □ mark on the gear II to the first tooth of the tray II, then push in the tray II slowly.

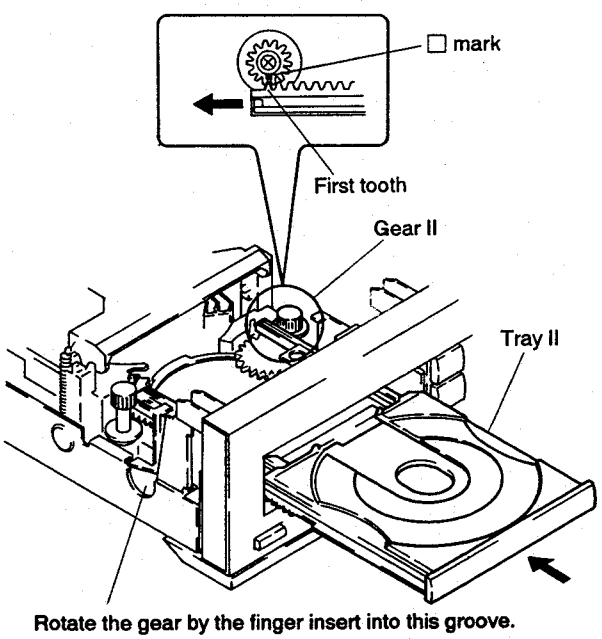

Fig. 2–15

2.7 ATTACHMENT OF TRAY I

(1) Press the OPEN/CLOSE button to make the disc II is in clamp condition, and the tray I is in open condition.

Note: When opening the tray I manually, insert a finger into the groove shown in Fig. 2–15, and rotate the idler gear clockwise, and tray II is clamped.
Further, rotate the idler gear, the pin pressing the switch appears at B position.When the pin moves to A position, stop the gear rotation. The gear I reaches to a position shown in the figure. At this position, attach the tray I.

(2) As shown in Fig. 2–16, adjust the first tooth of the tray I to the clogged part of the gear I, then push in the tray I slowly.

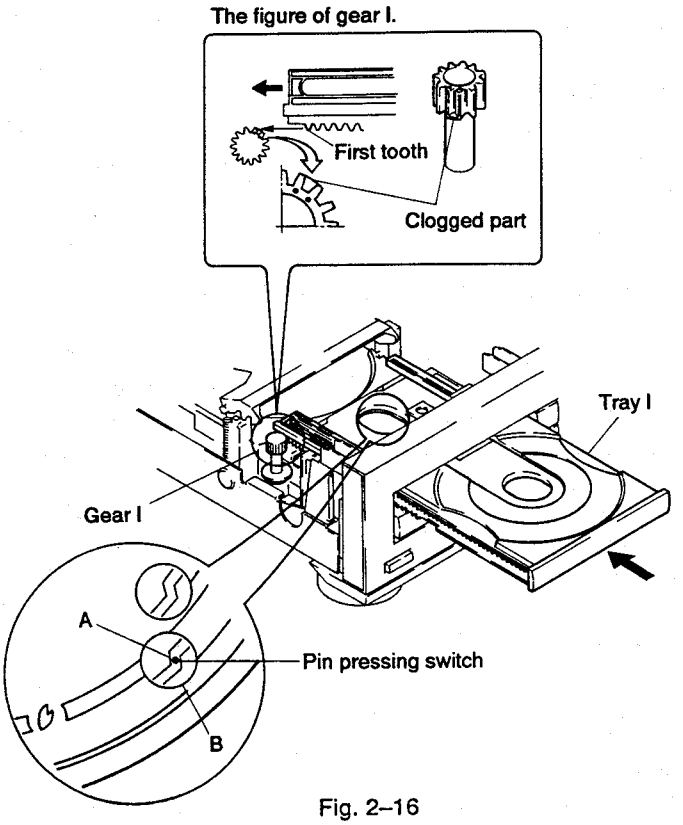

Fig. 2–16

2.8 STYLING

(1) Bend the wires as shown in Fig. 2–17.

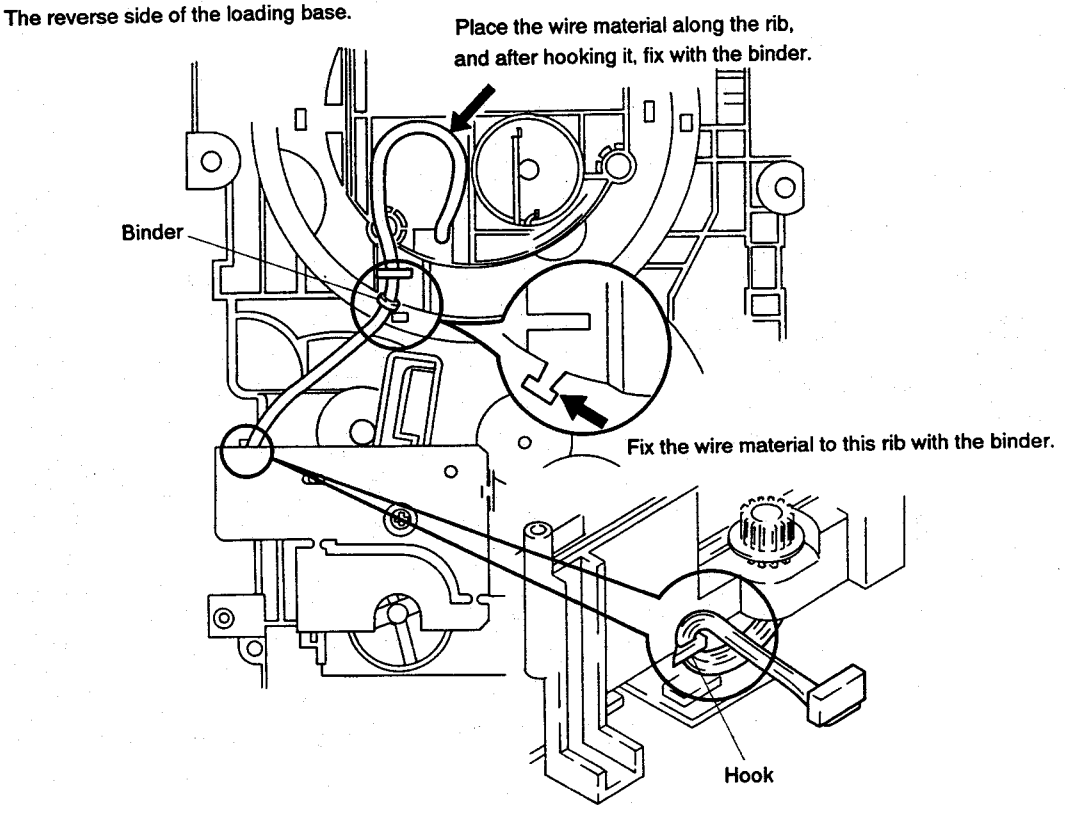
The reverse side of the loading base.
Place the wire material along the rib, and after hooking it, fix with the binder.
Binder
Fix the wire material to this rib with the binder.
Hook

Fig. 2–17

3. OPERATION OUTLINE

3.1 CHARACTERISTICS

The twin–tray mechanism of this unit is characterized by two basic features.
The first one is that both trays are driven by only one loading motor like in conventional single–tray system. This is a continuation of the design thought underlying the last generation twin–tray mechanism.
The second feature is the sandwiched tray design together with the utilization of a vertically moving servo mechanism for clamping, and horizontally arranged parts, resulting in a simplified construction and reducing the depth and width of the mechanism. As a result, the dimensions of the tray mechanism are almost the same size as for conventional single–tray system.
In addition, the mechanism is suited for mini–sized (260 mm width) products.

3.2 STRUCTURE OF THE TRAY SECTION

The tray section consists of a tray and a sub tray, as shown in Fig. 3–1. The tray slides in the sub tray grooves and is secured by three screws.
The switching between tray and sub tray operation is performed via a lock lever mounted on the sub tray.

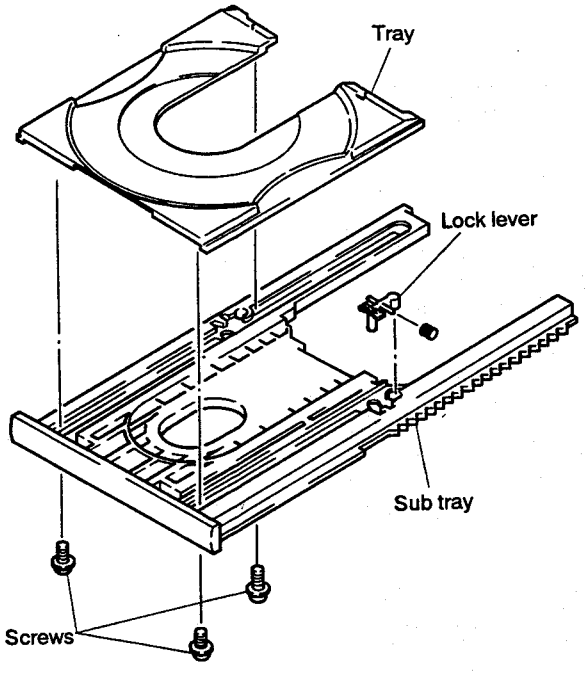

Fig. 3–1

As shown in Fig. 3–2, while the tray is opening or closing, the lock lever is held in the guide rib notch portion of the sub tray by the force of the lever spring, so that tray and sub tray move as one unit.

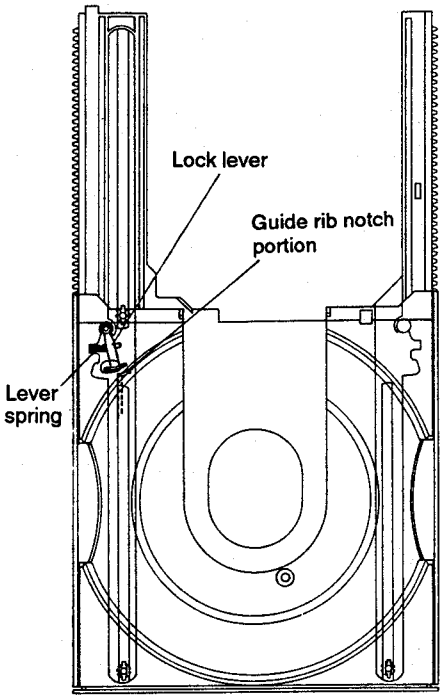

Fig. 3–2

When the tray is closed, the lock lever is disengaged from the guide rib notch of the sub tray by way of the guide groove in the loading base, and the interlocking between tray and sub tray is released.

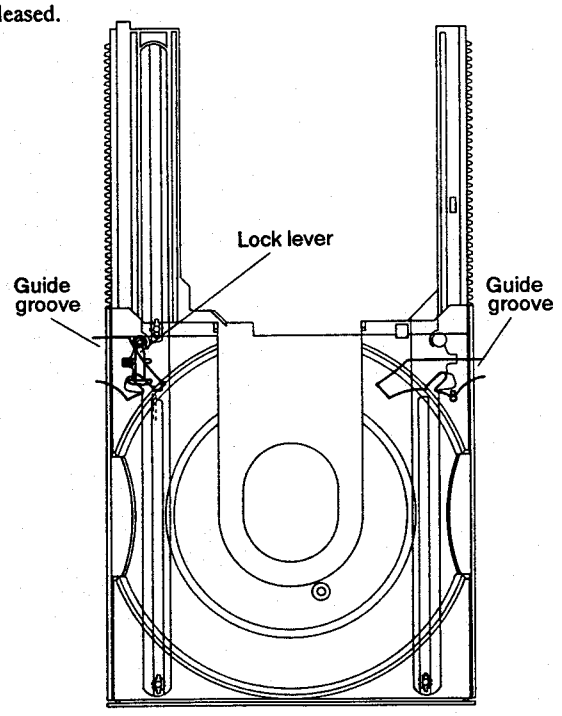

Fig. 3–3

When CHANGE or PLAY button is depressed, only the tray moves on the sub tray, as shown in Fig. 3–4. The driving gear for tray I is located on the left side of the tray and the lock lever is mounted on the left side of the sub tray. The driving gear and the lock lever for tray II are located on the right side.

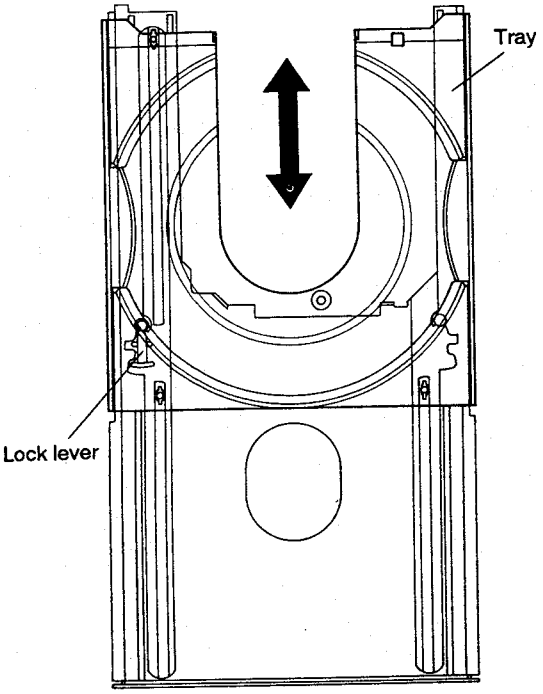

Fig. 3–4

3.3 POWER TRANSMISSION FROM THE LOADING MOTOR

As shown in Fig. 3–5, the rotation of the loading motor is transmitted to the main gear via a rubber belt, gear pulley, and idler gear.

The follow gears located on both side of the main gear are synchronized with the rotation of the main gear and rotate gear I and gear II respectively. Gears I and II drive the two trays.

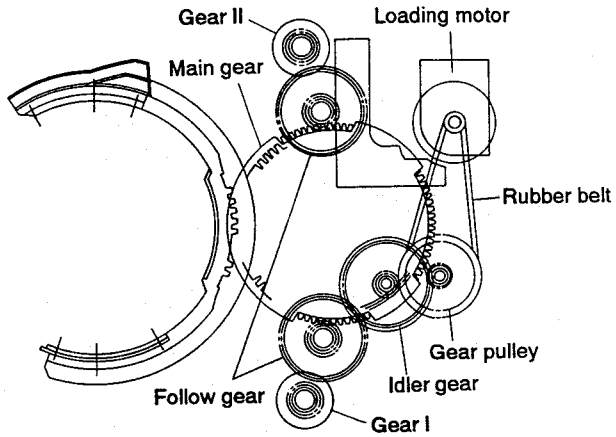

Fig. 3–5

As shown in Fig. 3–6, the drive power of the tray is transmitted by gears I and II to the gear section on the side of the sub tray and the tray. When the OPEN button is depressed, only the sub tray side is engaged, changing over to the tray side half–way between tray OPEN position and tray CLOSE position and then driving only the tray side to perform operation switching by the lock lever.

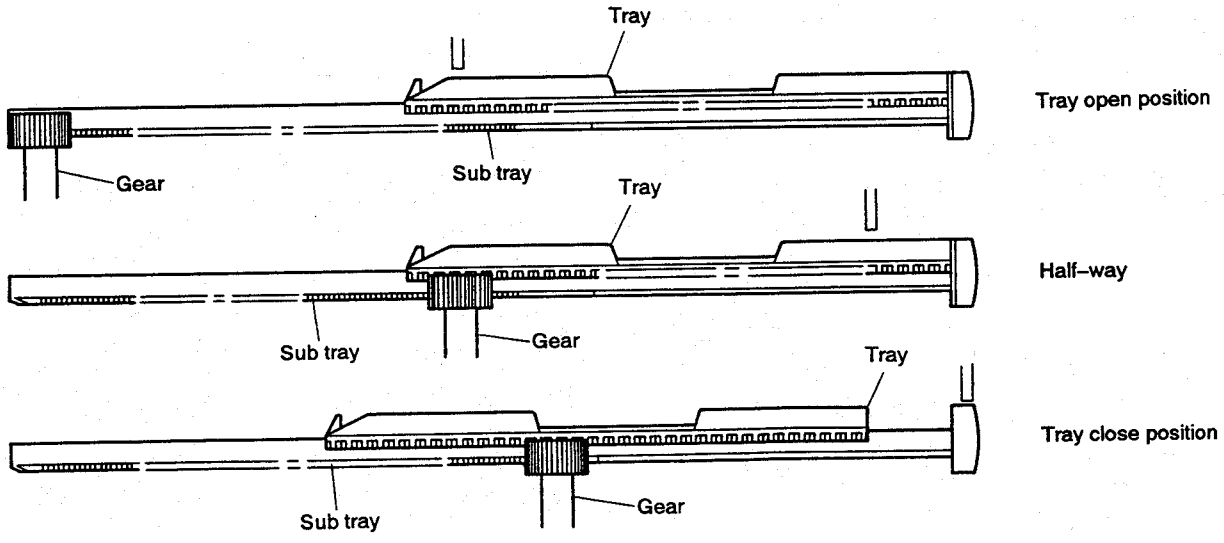

Fig. 3–6

The clamp cam, as shown in Fig. 3–7, rotates in synchronization with the main cam rotation to move the float base vertically. The cam groove of the clamp cam drives clamper arm B which, together with clamper arm U and the clamper holder, moves the clamper assembly up and down. (Refer to Fig. 1–4)

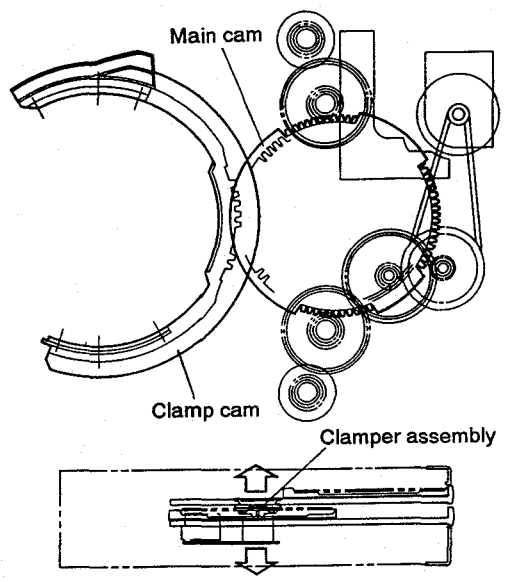

Fig. 3–7

3.4 TRAY POSITION DETECTION

The mechanism for tray position detection is shown in Fig. 3–8. The tray position is detected by the tips of three plastic springs, which are located on the loading base to follow the change of diameter in two grooves on the rear side of the main cam, and the ON/OFF condition of three switches located on the mechanism board.

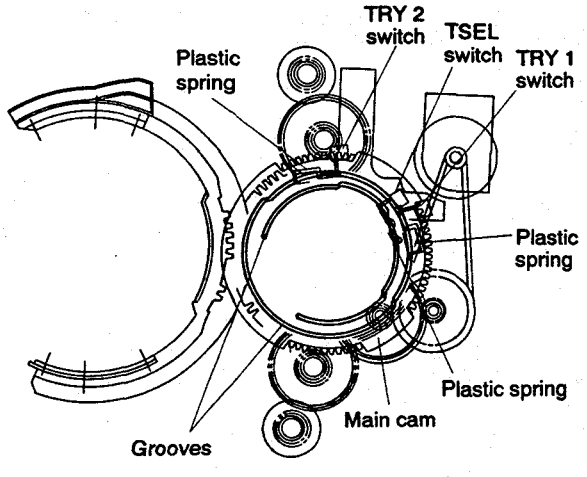

Fig. 3–8

3.5 MAIN CAM OPERATION

The main cam performs switching between operations.

(1) OPEN/CLOSE Operation

The two follow gears are located on the left and the right side of the main cam respectively. The left follow gear drives tray I via gear I and the right follow gear drives tray II via gear II.

As shown in Fig. 3–9, when tray I is in OPEN position, the left follow gear is engaged with the main cam gear. The non–toothed sections of the right follow gear and the main cam face each other, and the follow gear does not rotate. Therefore, when the motor rotates to tray I CLOSE direction (main cam rotates counterclockwise), only the left follow gear is driven to tray I to CLOSE direction. At this time, tray II is in the PLAY position.

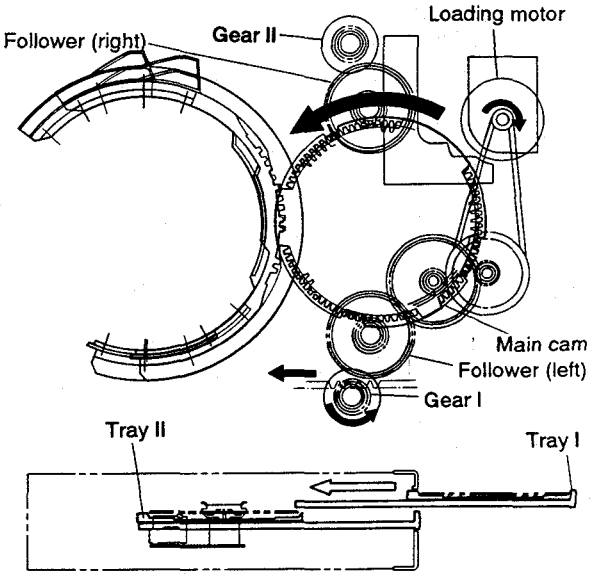

Fig. 3–9

		TRAY1	TRAY2	TRY1 switch	TSEL switch	TRY2 switch	Remarks
MECHANISM POSITION	①	OPEN	PLAY	L	H	L	When tray 2 is in play position, indicates that tray 1 has arrived in open position from close position.
	②	OPEN/ CLOSE	PLAY	H	H	L	When tray 2 is in play position, indicates that tray 1 is between close position and open position.
	③	CLOSE	PLAY	H	L	L	When tray 2 is in play position, indicates that tray 1 is at close position.
	④	CHANGE	CHANGE	H	L	H	When there is transition from ④ to ⑤, indicates that there is movement in progress with tray 1 to play position and tray 2 to close position.
	⑤	CHANGE	CHANGE	H	H	H	When there is transition from ⑤ to ④, indicates that there is movement in progress with tray 1 to close position and tray 2 to play position.
	⑥	PLAY	CLOSE	L	H	H	Indicates that tray 1 is in play position and tray 2 in close position.
	⑦	PLAY	OPEN/ CLOSE	L	L	H	When tray 1 is in play position, indicates that tray 2 is between close position and open position.
	⑧	PLAY	OPEN	L	L	L	When tray 1 is in play position, indicates that tray 2 has arrived in open position.

As shown in Fig. 3–10, when tray I is in CLOSE position, the non–toothed sections of the main cam and the left follow gear face each other, so that the follow gear does not rotate. At this time, the right follow gear is still positioned at the non–toothed section of the main cam so that tray II remains in PLAY position. OPEN/CLOSE operation of tray II is performed by reversing the above operation.

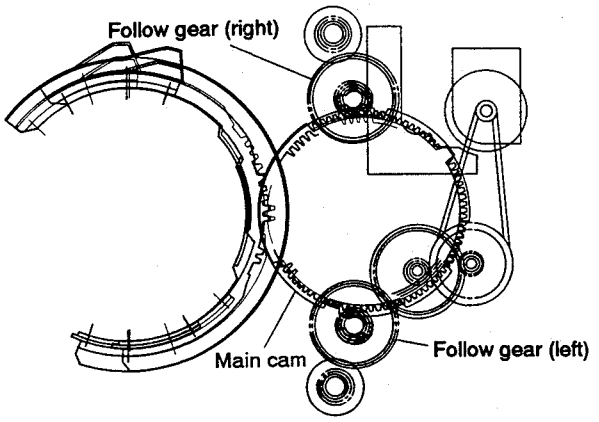

Fig. 3–10

(2) DISC Change Operation

As shown in Fig. 3–11, when tray I is in CLOSE position and tray II is in PLAY position, the follow gears (right and left) do not rotate as described above. At this time, the single tooth of the main cam and the 2–tooth of the clamp cam will be engaged and the clamp cam starts to rotate.

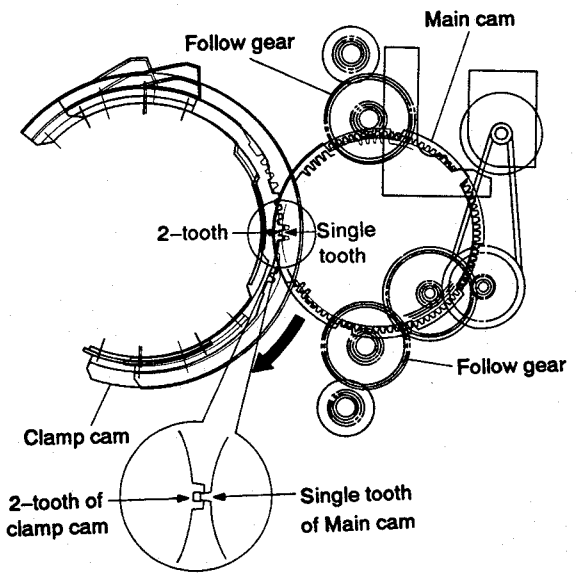

Fig. 3–11

When the main cam rotates counterclockwise as shown in Fig. 3–12, the clamp cam also rotates synchronously. The float base supported by the loading base guide moves down along the three V–shaped cams of the clamp cam. At the same time, the clamper arm moves along the groove on the right side of the clamp cam to raise the clamper assembly. By this operation the DISC clamp is released.

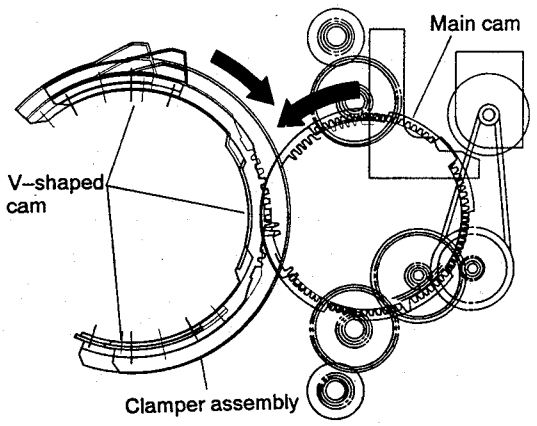

Fig. 3–12

When the main cam rotates further as shown in Fig. 3–13, the float base moves to the valley of the V–shaped cam and the gear section of the main cam and the follow gears are engaged. The follow gears (right and left) simultaneously rotate in clockwise direction. Driven by the follow gears, gears I and II rotate and simultaneously move tray I from the CLOSE position to the PLAY position and tray II from the PLAY position to the CLOSE position.

By this operation the DISC is changed. At this time, the non–toothed sections of the clamp cam and the main cam face each other so that the cams do not rotate.

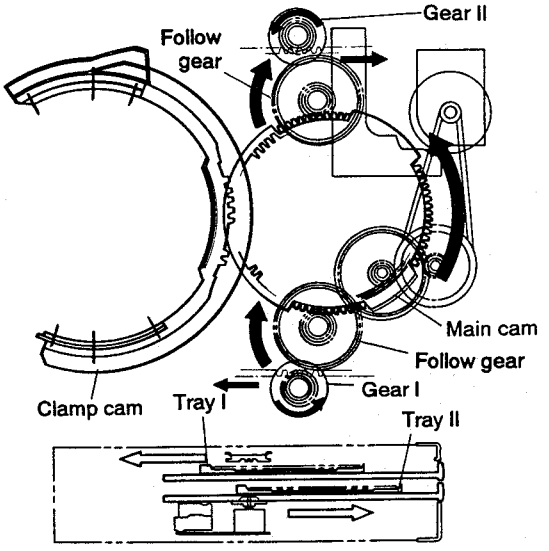

Fig. 3–13

As shown in Fig. 3–14, the second level gear of the main cam and the clamp cam gear engage just before the movements of tray I and tray II are completed, and the clamp cam starts to rotate again. The right and left follow gears face the non–toothed sections of the main cam, and at the same time the rotation stops.

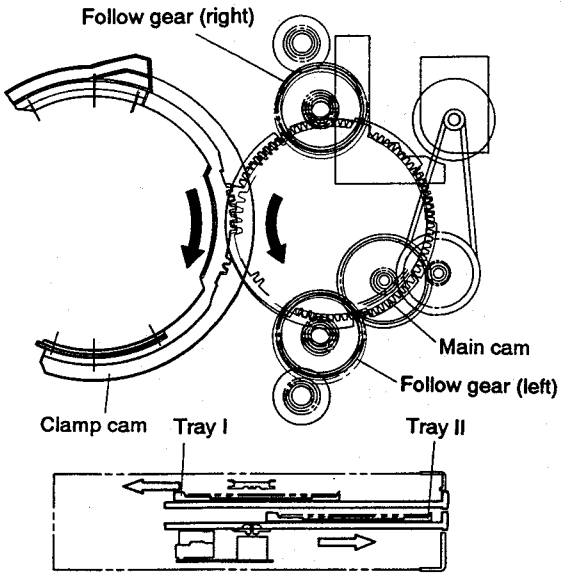

Fig. 3–14